CLAIM AMENDMENTS

<must include a complete listing of all the claims>
<after the claim number, the status must be indicated: (original), (currently amended), (previously amended), (canceled), (withdrawn), (new), (previously added), (reinstated - formerly claim #_), (previously reinstated), (re-presented - formerly dependent claim #_), or (previously re-presented)>
<claims not being currently amended must be a clean version>
<claims currently being amended must include markings to indicate the changes: Strikethrough for deleting text and underlining for added text>
<cancel a claim just by listing its status as canceled>
<all claims presented in numerical order>

1. (original) A switched capacitor circuit comprises:

capacitor having a first plate and a second plate:

first voltage reference module operably coupled to provide a first reference voltage;

second voltage reference module operably coupled to provide a second reference voltage;

first switching element operable to couple an input signal to the first plate during a first interval;

second switching element operable to couple the first plate to the second reference voltage during a second interval;

third switching element operable to couple the second plate to the first reference voltage to build a representative charge of the input signal across the capacitor during the first interval; and

fourth switching element operable to provide a charge transfer from the second plate during the second interval.

2. (original) The switched capacitor circuit of claim 1 further comprises:

operational amplifier that includes a first input, a second input, and an output, wherein the first input is operably coupled to the fourth switching element, the second input is operably coupled to the second reference voltage, and the output provides a representation of the input signal; and

a feedback capacitor operably coupled to the first input and the output of the operational amplifier.

3. (original) The switched capacitor circuit of claim 1 further comprises:

second capacitor having a first plate and a second plate:

fifth switching element operable to couple the input signal to the first plate of the second capacitor during the first interval;

sixth switching element operable to couple the first plate of the second capacitor to the second reference voltage during a second interval;

seventh switching element operable to couple the second plate of the second capacitor to the first reference

voltage to build a representative charge of the input signal across the second capacitor; and

eighth switching element operable to provide a charge transfer from the second plate of the second capacitor during the second interval;

operational amplifier that includes a first input, a second input, and a differential output, wherein the first input is operably coupled to the fourth switching element, the second input is operably coupled to the eighth switching element, and the differential output provides a representation of the input signal;

first feedback capacitor operably coupled to the first input and the differential output of the operational amplifier; and

second feedback capacitor operably coupled to the second input and the differential output of the operational amplifier.

4. (currently amended) The switched capacitor circuit of claim 1, wherein the first voltage reference module further comprises:

a divider operably coupled to the input signal, wherein a tap of the divider provides a common mode voltage of the input; and

operational amplifier having a first input, a second input, and an output, wherein the first input is operably coupled

to the tap of the divider, and the second input is coupled to the output, wherein the output provide the first reference voltage.

5. (original) The switched capacitor circuit of claim 1, wherein the second voltage reference module further comprises:

a divider operably coupled to a power supply, wherein a tap of the divider provides a common mode voltage of the power supply; and

operational amplifier having a first input, a second input, and an output, wherein the first input is operably coupled to the tap of the divider, and the second input is coupled to the output, wherein the output provide the second reference voltage.

6. (original) An analog to digital converter comprises:

sigma delta modulator operably coupled to receive an input signal and produce therefrom a digital stream of data, wherein the sigma delta modulator includes:

capacitor having a first plate and a second plate:

first voltage reference module operably coupled to provide a first reference voltage;

second voltage reference module operably coupled to provide a second reference voltage;

first switching element operable to couple the input signal to the first plate during a first interval;

second switching element operable to couple the first plate to the second reference voltage during a second interval;

third switching element operable to couple the second plate to the first reference voltage to build a representative charge of the input signal across the capacitor;

fourth switching element operable to provide a charge transfer from the second plate during the second interval;

operational amplifier that includes a first input, a second input, and an output, wherein at least the first input is operably coupled to receive the charge transfer, and wherein the output provides a representation of the input signal;

a feedback capacitor operably coupled to the first input and the output of the operational amplifier; and

comparator operably coupled to compare the representation of the input signal with a reference to produce the digital stream of data; and

digital decimation filter operably coupled to receive the digital stream of data and produce therefrom a digital output.

7. (original) The analog to digital converter of claim 6, wherein the sigma delta modulator further comprises:

second capacitor having a first plate and a second plate:

fifth switching element operable to couple the input signal to the first plate of the second capacitor during the first interval;

sixth switching element operable to couple the first plate of the second capacitor to the second reference voltage during a second interval;

seventh switching element operable to couple the second plate of the second capacitor to the first reference voltage to build a representative charge of the input signal across the second capacitor; and

eighth switching element operable to provide a charge transfer from the second plate of the second capacitor during the second interval;

second feedback capacitor operably coupled to the second input and the differential output of the operational amplifier, wherein the operational amplifier further includes a differential output, wherein the second input is operably coupled to the eighth switching element, and the differential output provides the representation of the input signal; and

first feedback capacitor operably coupled to the second input and the differential output of the operational amplifier.

8. (currently amended) The analog to digital converter of claim 6, wherein the first voltage reference module further comprises:

a divider operably coupled to the input signal, wherein a tap of the divider provides a common mode voltage of the input signal; and

second operational amplifier having a first input, a second input, and an output, wherein the first input is operably coupled to the tap of the divider, and the second input is coupled to the output, wherein the output provide the first reference voltage.

9. (original) The analog to digital converter of claim 6, wherein the second voltage reference module further comprises:

a divider operably coupled to a power supply, wherein a tap of the divider provides a common mode voltage of the power supply; and

second operational amplifier having a first input, a second input, and an output, wherein the first input is operably coupled to the tap of the divider, and the second input is coupled to the output, wherein the output provide the second reference voltage.

10. (original) A telecommunication analog front end comprises:

hybrid circuit operably coupled to inter-couple a transmit signal and a receive signal to and from a twisted pair;

digital to analog converter operably coupled to produce the transmit signal from a digital transmission signal; and

analog to digital converter that includes:

sigma delta modulator operably coupled to receive the receive signal and produce therefrom a digital stream of data, wherein the sigma delta modulator includes:

capacitor having a first plate and a second plate:

first voltage reference module operably coupled to provide a first reference voltage;

second voltage reference module operably coupled to provide a second reference voltage;

first switching element operable to couple the input signal to the first plate during a first interval;

second switching element operable to couple the first plate to the second reference voltage during a second interval;

third switching element operable to couple the second plate to the first reference voltage to build a representative charge of the input signal across the capacitor;

fourth switching element operable to provide a charge transfer from the second plate during the second interval;

operational amplifier that includes a first input, a second input, and an output, wherein at least the first input is operably coupled to receive the charge transfer, and wherein the output provides a representation of the input signal;

a feedback capacitor operably coupled to the first input and the output of the operational amplifier; and

comparator operably coupled to compare the representation of the input signal with a reference to produce the digital stream of data; and

digital decimation filter operably coupled to receive the digital stream of data and produce therefrom a digital receive signal.

11. (currently amended) The telecommunication analog front end of claim 10, wherein the sigma delta modulator further comprises:

second capacitor having a first plate and a second plate:

fifth switching element operable to couple the received signal to the first plate of the second capacitor during the first interval;

sixth switching element operable to couple the first plate of the second capacitor to the second reference voltage during a second interval;

seventh switching element operable to couple the second plate of the second capacitor to the first reference voltage to build a representative charge of the input signal across the second capacitor;

eighth switching element operable to provide a charge transfer from the second plate of the second capacitor during the second interval;

second feedback capacitor operably coupled to the second input and the differential output of the operational amplifier, wherein the operational amplifier further includes a differential output, wherein the second input is operably coupled to the eighth switching element, and the differential output provides the representation of the input signal; and

first feedback capacitor operably coupled to the <u>first</u> ~~second~~ input and the differential output of the operational amplifier.

12. (currently amended) The telecommunication analog front end of claim 10, wherein the first voltage reference module further comprises:

a divider operably coupled to the input signal, wherein a tap of the divider provides a common mode voltage of the input signal; and

second operational amplifier having a first input, a second input, and an output, wherein the first input is operably coupled to the tap of the divider, and the second input is coupled to the output, wherein the output provide the first reference voltage.

13. (original) The telecommunication analog front end of claim 10, wherein the second voltage reference module further comprises:

a divider operably coupled to a power supply, wherein a tap of the divider provides a common mode voltage of the power supply; and

second operational amplifier having a first input, a second input, and an output, wherein the first input is operably coupled to the tap of the divider, and the second input is coupled to the output, wherein the output provide the second reference voltage.

14. (original) The telecommunication analog front end of claim 10, wherein the hybrid further comprises an adjustable impedance.